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MCANDREWS HELD & MALLOY, LTD 500 WEST MADISON STREET SUITE 3400 CHICAGO, IL 60661			CORBETT, JOHN M	
			ART UNIT	PAPER NUMBER
			2882	

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Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/725,302

Applicant(s)

POWELL, DAVID L.

Examiner

John M. Corbett

Art Unit

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. The amendment filed on 17 October 2005 in response to the Office Action dated 27 July 2005 has been received. The Examiner has fully considered the contents of the amendment and notes the following:

- a. The objections to the specification have been withdrawn.
- b. The objection to the drawings has been withdrawn.
- c. The Examiner acknowledges that claims 1, 7, 11, 15, 19, 25 and 27 have been amended. Claims 1-29 are currently pending.
- d. The 35 USC § 112 rejection of amended claim 9 has been withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4, 7-9, 11-12, 19-20 and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Burke et al. (5,305,363).

With respect to claim 1, Burke et al. teaches a medical imaging device having a main body (See Fig 1 item II and Abstract) and an imaging element (See Fig 1 item I

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and Abstract); and an auxiliary module (See Fig. 1 item III) removably connected to the medical imaging device having a cooling unit (See Fig. 1 item 16) configured cool and to circulate chilled liquid to and from the imaging element, wherein the chilled liquid absorbs heat produced by the imaging element. (Col. 5 lines 1-11 and Fig. 2 item 10 and 12.) Note: The module is removable by any means.

With respect to claim 2, Burke et al. further teaches the imaging element includes an x-ray tube, wherein the cooling unit circulates the chilled liquid over and within the imaging element. (See Fig 1 item I and Fig. 2 item 10 and 12)

With respect to claim 4, Burke et al. further teaches a cooling duct surrounding at least a portion of the imaging element (See Fig. 2 item 10 and 12), the cooling duct having a fluid inlet and an fluid outlet; a fluid input line in fluid communication with the cooling unit and the fluid inlet, wherein the chilled liquid is supplied to the cooling duct from the cooling unit through the fluid input line; and a fluid return line in fluid communication with the cooling unit and the fluid outlet, wherein the chilled liquid is returned to the cooling unit through the fluid return line. (See Fig. 1 item 14, 16 and unnumbered fluid tube attached to heat exchanger 16 and toroidal x-ray tube I)

With respect to claim 7, Burke et al. further teaches that the auxiliary module is permanently affixed to the floor. (See Fig. 1 item 14 and 16)

With respect to claim 8, Burke et al. further teaches that the auxiliary module further comprises a booster battery pack, wherein the booster battery pack is configured to be electrically connected to the medical imaging device in order to provide additional power to the medical imaging device. (See Fig. 1 item III, Fig. 2 item 93 and Col. 6 line 66 - Col. 7 line 4)

With respect to claim 9, Burke et al. further teaches that the auxiliary module is remotely located from the medical imaging device. (See Fig. 1 item III)

With respect to claim 11, Burke et al. teaches a medical imaging device having a main body (See Fig 1 item II and Abstract) and an imaging element (See Fig 1 item I and Abstract); and an auxiliary module having a booster battery pack, wherein the booster battery pack is configured to be electrically connected to the medical imaging device in order to provide additional power to the medical imaging device. (See Fig. 1 item III, Fig. 2 item 93 and Col. 6 line 66 - Col. 7 line 4), wherein the auxiliary module is separate, distinct and removably connected to the medical imaging device. Note: The connection of the booster battery pack is accomplished by an electrical connection. The electrical connection can be removed and reconnected as necessary during assembly and disassembly of the medical imaging device and for maintenance purposes. The Examiner does not accord patentable weight to the terms separate and distinct in the claim since any item that can be assembled and then disassembled is always separate and distinct when disassembled.

With respect to claim 12, Burke et al. further teaches the medical imaging device is an x-ray system and the imaging element includes an x-ray tube. (See Fig 1 item I and Abstract)

With respect to claim 18, Burke et al. further teaches a power boost receptacle electrically connected to a power supply system (See Fig. 1 where power supply is electrically connected to the mounting assembly II by a power cable routed through an operator control 82); a power cable electrically connected to the booster battery pack (See Fig. 2 item 90, 93 and connection from building electrical system) wherein the power cable is considered to be removably connected to the power boost receptacle so that the power supply system may draw power from the booster battery pack. (See Col. 6 line 66 – Col. 7 line 4)

With respect to claim 19, Burke et al. teaches an auxiliary module (See Fig. 1 item III) comprising a cooling unit configured to cool (Heat pump cools) and circulate

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chilled liquid to and from the imaging element, wherein the chilled liquid absorbs heat produced by the imaging element (See Fig. 1 item 14 and 16, Fig. 2 item 10 and 12, Col. 5 lines 1-11); and a booster battery pack, wherein the booster battery pack is configured to be electrically connected to the medical imaging system in order to provide additional power to the medical imaging system. (See Fig. 1 item III, Fig. 2 item 93 and Col. 6 line 66 - Col. 7 line 4) Note: The recitation "being removably connected to said medical imaging device" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

With respect to claim 20, Burke et al. further teaches the imaging element includes an x-ray tube and the medical imaging device is an x-ray imaging system. (See Fig. 1 item I and Abstract)

With respect to claim 23, Burke et al. further teaches that the auxiliary module is permanently affixed to a floor. (See Fig. 1 item III)

With respect to claim 24, Burke et al. further teaches the auxiliary module is separate and distinct from the medical imaging device. As shown in figure 1, the heat exchanger (16) is connected to the toroidal ring x-ray tube (I) through a long flexible cooling hose and the high voltage generator in section III is routed through the operator console (82) which similarly is connected to the assembly (II) by a long flexible cable.

3. Claims 1, 3-5, 7, 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Okamura et al. (WO 03/002001 A1).

With respect to claim 1, Okamura et al. teaches a medical imaging device having a main body (See Fig. 2) and an imaging element (See Fig. 2 item 1 and 14); and an auxiliary module removably connected to the medical imaging device having a cooling unit (See Fig. 2 item 7) configured to cool and circulate chilled liquid to and from the imaging element, wherein the chilled liquid absorbs heat produced by the imaging element. (See Fig. 1 and Abstract) Note: The module is removable by any means.

With respect to claim 3, Okamura et al. further teaches a C-arm (See Fig. 2 item 21) supported by the main body, wherein the x-ray tube is positioned on an end of the C-arm. (See Fig. 2 item 1)

With respect to claim 4, Okamura et al. further teaches a cooling duct surrounding at least a portion of the imaging element, the cooling duct having a fluid inlet and an fluid outlet; a fluid input line in fluid communication with the cooling unit and the fluid inlet, wherein the chilled liquid is supplied to the cooling duct from the cooling unit through the fluid input line; and a fluid return line in fluid communication with the cooling unit and the fluid outlet, wherein the chilled liquid is returned to the cooling unit through the fluid return line. (See Fig. 1)

With respect to claim 5, Okamura et al. further teaches the cooling duct is considered to be removably connected to the imaging element. (As the Applicant has pointed out in section B.1. of their remarks filed 17 October 2005, "The x-ray detector (14) is accommodated in, for example, a glass casing (15), and a cooling tube (16) through which the cooling water (5) flows, is **disposed on** the upper surface of the glass casing (15)." The cooling tube (16) as shown in Figure 5 is disposed on the heat conducting plate (17c) with the only requirement to it to perform it's function is that it be in thermal contact with the plate. This does not require it to be permanently affixed to the plate but merely be disposed on (be put in place).

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With respect to claim 7, Okamura et al. shows that the auxiliary module is permanently affixed to the floor. (See Fig. 2)

With respect to claim 9, Okamura et al. teaches that the auxiliary module is remotely located from the medical imaging device. (See Fig. 2 item 7)

For applicant's convenience, a copy of US Patent Application Publication document, Okamura et al. (US2004/0234040 A1), is provided as an English language translation of WIPO document, Okamura et al. (WO 03/002001 A1).

4. Claims 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderton (Re. 35,025).

With respect to claim 11, Anderton teaches a medical imaging device having a main body (See Fig. 1 item 13, 19 and 20) and an imaging element (See Fig. 1 item 23-25); and an auxiliary module having a booster battery pack (See Fig. 2 item 49 and Col. 13 lines 2-4), wherein the booster battery pack is configured to be electrically connected to the medical imaging device in order to provide additional power to the medical imaging device (See Fig. 2 and Col. 12 lines 41-44), wherein the auxiliary module is separate, distinct and removably connected to the medical imaging device. Note: The connection of the booster battery pack must be accomplished by an electrical connection, wire or cable. The electrical connection can be removed and reconnected as necessary during assembly and disassembly of the medical imaging device and for maintenance purposes. The Examiner does not accord patentable weight to the terms separate and distinct in the claim since any item that can be assembled and then disassembled is always separate and distinct when disassembled.



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With respect to claim 12, Anderton further teaches the medical imaging device is an x-ray system (See Title) and the imaging element includes an x-ray tube. (See Fig. 1 item 23)

With respect to claim 13, Anderton further teaches a C-arm supported by the main body (See Fig. 1 item 12), wherein the x-ray tube is positioned on an end of the C-arm. (See Fig. 1 item 12 and 23)

With respect to claim 14, Anderton further teaches that the auxiliary module is mobile. (See Fig. 1 caster assembly attached to item 11 (mainframe), Col. 4 line 6 and Col. 12 lines 53-56)

With respect to claim 15, Anderton further teaches the apparatus of claim 11. Since claim 15 fails to further limit the structure of a medical imaging device, claim 15 is rejected with claim 11. Note: A floor or a wall is not part of the medical imaging device.

5. Claims 11-12 and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yahata et al. (5,226,064).

With respect to claim 11, Yahata et al. teaches a medical imaging device having a main body (See Fig. 2 item 7) and an imaging element (See Fig. 2 item 9 and 10); and an auxiliary module having a booster battery pack (See Fig. 1, 3 and 4 items 5 and 5A), wherein the booster battery pack is configured to be electrically connected to the medical imaging device in order to provide additional power to the medical imaging device (See Fig. 1, 3 and 4, Col. 3 lines 43-49, Col. 4 lines 58-62 and Col. 5 line 67 – Col. 6 line 9), wherein the auxiliary module is separate, distinct and removably connected to the medical imaging device. Note: The connection of the booster battery pack must be accomplished by an electrical connection, wire or cable. The electrical

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connection can be removed and reconnected as necessary during assembly and disassembly of the medical imaging device and for maintenance purposes. The Examiner does not accord patentable weight to the terms separate and distinct in the claim since any item that can be assembled and then disassembled is always separate and distinct when disassembled.

With respect to claim 12, Yahata et al. further teaches the medical imaging device is an x-ray system and the imaging element includes an x-ray tube. (See Fig. 1, 3 item 3 and Fig. 2, 4 items 9)

With respect to claim 15, Yahata et al. further teaches the apparatus of claim 11. Since claim 15 fails to further limit the structure of a medical imaging device, claim 15 is rejected with claim 11. Note: A floor or a wall is not part of the medical imaging device.

With respect to claim 16, Yahata et al. further teaches the auxiliary module is remotely located from the main body. (See Fig. 2 item 100)

6. Claims 1-4, 6-7 and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Busse et al. (6,669,366 B2).

With respect to claim 1, Busse et al. teaches a medical imaging device having a main body (See Fig. 1) and an imaging element (See Fig. 1 item 1, 2 and 5); and an auxiliary module removably connected to the medical imaging device having a cooling unit configured to cool and circulate chilled liquid to and from the imaging element, wherein the chilled liquid absorbs heat produced by the imaging element. (See Fig. 2) Note: The module is removable by any means.

With respect to claim 2, Busse et al. further teaches that the imaging element includes an x-ray tube (See Fig 1 item 2), and that the cooling unit circulates the chilled liquid over and within the imaging element. (See Fig. 2 and Col. 2 lines 55-65)

With respect to claim 3, Busse et al. further teaches a C-arm supported by the main body, wherein the x-ray tube is positioned on an end of the C-arm. (See Fig. 1 and Col. 4 lines 45-52)

With respect to claim 4, Busse et al. further teaches a cooling duct surrounding at least a portion of the imaging element, the cooling duct having a fluid inlet and an fluid outlet; a fluid input line in fluid communication with the cooling unit and the fluid inlet, wherein the chilled liquid is supplied to the cooling duct from the cooling unit through the fluid input line; and a fluid return line in fluid communication with the cooling unit and the fluid outlet, wherein the chilled liquid is returned to the cooling unit through the fluid return line. (See Fig. 2 and Col. 4 line 55 – Col. 5 line 2)

With respect to claim 6, Busse et al. further teaches that the auxiliary module is mobile. (See Fig. 1 item 4. Note wheels on bottom of console, hence entire system is mobile which includes auxiliary module.)

With respect to claim 7, Busse et al. teaches the apparatus of claim 1. The auxiliary module can be permanently affixed to one of a floor and a wall by any means. Accordingly, claim 7 is rejected with claim 1.

With respect to claim 25, Busse et al. teaches a method of cooling a mobile x-ray device having a C-arm with an x-ray tube positioned on one end of the C-arm and a detector on the other end of the C-arm (See Fig. 1 items 1-3 and 5 and Col. 4 lines 45-50), by operatively connecting the cooling unit which forms the auxiliary module in a removable fashion to the mobile x-ray device; cooling the liquid with the cooling unit (See Col. 3 lines 16-19); passing the chilled liquid from the cooling unit to the x-ray

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tube (See Fig. 2 and Col. 3 lines 4-11); and circulating the chilled liquid around at least a portion of the x-ray tube such that the chilled liquid absorbs heat produced by the x-ray tube during an x-ray imaging procedure. (See Col. 4 lines 61-65) Note: The module is removable by any means.

With respect to claim 26, Busse et al. further teaches providing a cooling duct around at least a portion of the x-ray tube, and wherein the passing includes passing the chilled liquid from the cooling unit to the x-ray tube through a first tube that is in fluid communication with the cooling unit and the cooling duct; and returning the chilled liquid back to the cooling unit through a second tube that is in fluid communication with the cooling unit and the cooling duct. (See Fig. 2 item 7-9 and Col. 4 line 55 – Col. 5 line 2)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura et al. (WO 03/002001 A1) as applied to claim 1 above, and further in view of Innovative Technology Summary Report (ITSR), Portable X-ray, K-Edge Heavy Metal Detector.

With respect to claim 10, Okamura et al. teaches all the limitations of the claimed invention except that the auxiliary module includes a rolling cart that supports the cooling unit.

ITSR teaches an auxiliary module for an x-ray imaging system that includes a rolling cart that supports a cooling unit. (See Fig. 5 and 9)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the stationary auxiliary module of Okamura et al. to include the cart system of ITSR to make the module mobile since a person would have been motivated to increase flexibility in the use of space around the medical imaging system so that additional equipment, such as patient life support and monitoring systems, could be conveniently arranged in the room housing the medical imaging system during imaging.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yahata et al. (5,226,064) as applied to claim 11 above, and further in view of Innovative Technology Summary Report (ITSR), Portable X-ray, K-Edge Heavy Metal Detector.

With respect to claim 17, Yahata et al. teaches all the characteristic features of the invention as described above, but fails to teach that the auxiliary module includes a rolling cart that supports the booster battery pack.

ITSR teaches an auxiliary module for a portable x-ray system that includes a rolling cart and that supports the high voltage unit. (See Fig. 5 and 9)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the stationary auxiliary module of Yahata et al. to include the cart system of ITSR to make the auxiliary module mobile since a person would have been motivated to increase flexibility in the use of space around the medical imaging system so that additional equipment, such as patient life support and monitoring systems, could be conveniently arranged in the room housing the medical imaging system during imaging.

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9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. (5,305,363) as applied to claims 19 and 20 above, and further in view of Busse et al. (6,669,366 B2).

With respect to claim 21, Burke et al. teaches all the limitations of the invention except that the x-ray imaging device includes a C-arm having a first and second prong, wherein the x-ray tube is positioned on the first prong, and a detector is positioned on the second prong.

Busse et al. teaches an x-ray imaging device that includes a C-arm having a first and second prong, wherein the x-ray tube is positioned on the first prong, and a detector is positioned on the second prong. (See Fig. 1)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the medical imaging system of Burke et al. to include the C-arm configuration of Busse et al. since a person would have been motivated to use the less restrictive open structure of the C-arm configuration for positioning the imaging element about the patient rather than the more restrictive closed structure of the toroidal configuration.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. (5,305,363) as applied to claim 19 above, and further in view of Innovative Technology Summary Report (ITSR), Portable X-ray, K-Edge Heavy Metal Detector.

With respect to claim 22, Burke et al. teaches all the limitations of the invention except that the booster battery pack and the cooling unit are on a mobile cart.

ITSR teaches an auxiliary module for a portable x-ray system that includes a rolling cart and that supports the high voltage unit. (See Fig. 5 and 9)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the stationary auxiliary module of Burke et al. to include the cart system of ITSR to make the auxiliary module mobile since a person would

have been motivated to increase flexibility in the use of space around the medical imaging system so that additional equipment, such as patient life support and monitoring systems, could be conveniently arranged in the room housing the medical imaging system during imaging.

11. Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. (5305363) and further in view of Okamura et al. (WO 03/002001 A1) and Anderton (Re 35,025).

With respect to claim 25, Burke et al. teaches a method of cooling an x-ray tube in an x-ray device where an auxiliary module (See Fig. 1 item 14 and 16) having a cooling unit is operatively connected to the x-ray device (See Fig. 1 where two unlabeled cooling liquid tubes are connected to (16), (14), x-ray tube (I) and then back to (16) forming a closed loop) in a removable fashion. (If the tubing can be connected, then it can be disconnected. Also, the tubing can be cut by any known means and thus removed.) The cooling unit produces chilled cooling liquid. (Heat exchanger (16) chills the cooling liquid.) The chilled liquid is passed from the cooling unit to the x-ray tube. (See unlabeled cooling liquid tubes noted above.) The chilled liquid is circulated (by pump (P), item 14) around at least a portion of the x-ray tube such that the chilled liquid absorbs heat produced by the x-ray tube during the imaging procedure. (Col. 15 line 1-11) Burke et al. also teaches the use of a cooling fluid that is a dielectric so that the cooling fluid does not short the anode to the housing. (See Col. 7 line 61-64) Burke et al. fails to teach the x-ray device is a mobile C-arm.

Okamura et al. teaches a method of cooling an x-ray device having a C-arm (See Fig. 2) with an auxiliary module having a cooling unit (7) that circulates (See arrows in Fig. 1) cooled water (5) to the x-ray device. The cooled water is used to cool insulating oil (3) via a heat exchanger (4). The oil is then circulated around at least a portion of the x-ray tube such that the chilled oil absorbs heat produced by the x-ray tube during the imaging procedure. (See Fig. 1 item 1-3)

Anderton teaches the method of making the C-arm x-ray device mobile. (See wheels in Fig. 1) Anderton also teaches the method of incorporating the use of a panel (17) for controlling the coupling of power and other devices to the mobile C-arm unit. (See Col. 4 line 28-30)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Burke et al., in which a dielectric liquid is circulated around the x-ray tube, to include the use of the C-arm structure of Okamura et al. and to accord mobility to the C-arm device while coupling external devices to the mobile C-arm through the use of a panel as described in Anderton since a person would have been motivated to have a method that allowed for the use of the more easily accessible C-arm structure that would be moved into position as necessary while taking advantage of the increased heat transfer efficiency and reduced weight in a system that required only a single circulating means that cooled the insulating oil directly and then circulated it directly around the x-ray tube. Additionally, it would have been obvious to utilize the panel (17) of Anderton to couple the cooling tubes to the mobile C-arm to reduce the weight of the C-arm thereby making it easier to move.



With respect to claim 27, Okamura et al. further teaches the method of permanently affixing the auxiliary module to a floor. (See Fig. 2)

12. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Busse et al. (6,669,366 B2) as applied to claim 25 above, and further in view of Okamura et al. (WO 03/002001 A1).

With respect to claim 28, Busse et al. teaches all the limitations of the invention except remotely locating the auxiliary module from the x-ray device.

Okamura et al. teaches remotely locating the auxiliary module from the x-ray device. (See Fig. 2 item 7 and 18)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mobile x-ray device of Busse et al. to allow one to remotely locate the auxiliary module as suggested by Okamura et al. since a person would have been motivated to reduce the weight of the mobile x-ray imaging device thereby increasing the ease of movement of the device and reduce the amount of exhaust heat expelled into the imaging room. Additionally, a person would have been motivated to remove the auxiliary cooling module from the mobile c-arm imaging device so that a higher capacity cooling module could be used, not limited by the space constraints of the mobile imaging device.

13. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Busse et al. (6,669,366 B2) as applied to claim 25 above, and further in view of Burke et al. (5,305,363).

With respect to claim 29, Busse et al. teaches all the limitations of the invention except for providing a booster battery pack in the auxiliary module and electrically connecting the booster battery pack to the x-ray device so that the x-ray device draws power from the booster battery pack.

Burke et al. teaches the auxiliary module further consists of a booster battery pack electrically connected to the x-ray device so that the x-ray device draws power from the booster battery pack. (Col. 6 line 66 – Col. 7 line 4)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the auxiliary module of Busse et al. with the booster battery pack of Burke et al. since a person would have been motivated to reduce peak power demand while continuing to utilize increase power output by charging the booster battery at a relatively low rate when the x-ray tube is not energized and drawing upon the battery at a higher rate while the x-ray tube was energized while maintaining the mobility of the system mounted on a mobile cart.

### ***Response to Arguments***

14. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section A. 1.), the Applicant makes the following points when arguing that Burke et al. does not anticipate claims 1-2, 4, 19 nor claims 7-9, 20 and 23-24 that depend on claims 1 and 19.

a. The Applicant acknowledges that the system of Burke et al. "utilizes a cooling fluid" while arguing, "Burke et al. only describes the fluid" and "does not, expressly of inherently describe a cooling unit to cool and circulate" the cooling fluid. In response, the Examiner notes that Burke et al. describes a heat exchanger (16) through which the cooling fluid is circulated by the fluid circulating means (14) to keep the target

anode cool. (See Col. 5 line 8-11 and Fig. 1 item 14 and 16) Burke et al. clearly anticipates that the purpose of the heat exchanger is to remove heat from the cooling fluid after cooling the anode and the utilize the fluid circulating means to re-circulate the cooled liquid back to the anode in a closed loop type cooling system.

b. The Applicant acknowledges that the system of Burke et al. describes, "a heat exchanger that circulates fluid to cool the anode", but argues, "it does not describe a unit that cools the temperature to the point in which it is considered **chilled**." In response, the Examiner notes that chilled is defined as "To lower in temperature; cool." The Applicant has not assign a special definition to the term **chilled** such as a temperature range or other physical parameter. The Applicant simple stated on page 9 line 4-5 of the specification, "The cooling unit 32 is configured to pump, or otherwise supply, cooled (i.e. chilled) fluid". The Applicant also states on page 14 line 19-20 that "As the chilled fluid absorbs heat, the temperature of the chilled fluid increases." which serves the identical function as the cooled fluid of Burke et al.

c. The Applicant acknowledges that the system of Burke et al. "describes a circulating means" (for the cooling fluid) but argues that the "circulating means is separate and distinct from the heat exchanger, neither of which is part of an individual module as described in claim 1". In response, the Examiner asserts that the fluid circulating means (14) and the heat exchanger (16) are two components of one embodiment of the auxiliary module of Burke et al.. An auxiliary module as described in claim 1 is constructed of components that are specifically designed to perform a unique

function and then configured to operate in a coordinated fashion as is described by Burke et al and noted by the Examiner above in (a).

As noted in the Burke et al. 102(b) rejection of claim 1 above, the auxiliary module is outlined as components from electronics section, item III of Figure 1. As noted in the Figure, the elements of section III are interfaced to sections I and II by two fluid transfer tubes and one cable. The auxiliary module is considered to be removably connected since the two fluid transfer tubes and one cable can be cut thereby allowing the auxiliary module to be removed.

The Examiner additionally notes that patentable weight has not been accorded to the term **chilled** since it is not directed to a further structural limitation to the claimed medical imaging system or auxiliary module.

15. Applicant's arguments, see Applicant's Remarks (section A. 2.), filed 17 October 2005, with respect to claim 5 have been fully considered and are persuasive. The Examiner takes note that the cooling fluid path or channel (12) of Burke et al. cannot be removed and at the same time allow the system to maintain the vacuum seal necessary for the x-ray tube to work properly since the x-ray tube and cooling channel share a common component, the wall B as noted in Figure 3. The 102(b) rejection of Burke et al. for claim 5 has been withdrawn.

16. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section A. 3.), the

Applicant argues that Burke et al. does not anticipate the amended claim 11 or claim 12 that depends on amended claim 11.

In response to applicant's argument that the reference fails to show certain features of applicant's invention, the Examiner notes that the connection of the booster battery pack is accomplished by an electrical connection. The electrical connection can be removed and reconnected as necessary during assembly and disassembly of the medical imaging device and for maintenance purposes. Any components that can be connected can be disconnected. The Examiner does not accord patentable weight to the terms separate and distinct in the claim since any item that can be assembled and then disassembled is always separate and distinct when disassembled. See Burke et al. 102(b) rejection of claim 11 above.

17. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section A. 4.), the Applicant makes the following point when arguing that Burke et al. does not anticipate claim 19 nor claims 20 and 23-24 that depend on claim 19.

The Applicant acknowledges that the system of Burke et al. "describes a **heat exchanger for circulating fluid**, as well as an energy storage device", the Applicant argues that Burke et al. "does not expressly or inherently describe an auxiliary module comprises" both a cooling unit and a booster battery pack. In response, the Examiner asserts that the fluid circulating means (14), the heat exchanger (16) and energy storage device (93) are all components of the auxiliary module of Burke et al. An

auxiliary module as described in claim 19 is constructed of components that are specifically designed to perform a unique function and then configured to operate in a coordinated fashion as is described by Burke et al.

18. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section B. 1.), the Applicant makes the following point when arguing that Okamura et al. does not anticipate claim 1 nor claims 2-5, 7 and 9 that depend on claim 1.

a. The Applicant's argues again that there is a distinction between a chilled liquid and a cooled liquid the Applicant concedes that Okamura et al. uses. The negation of the argument that there is a difference between a cooled and chilled liquid was addressed above in section (b) of Examiner's response to Applicant's remarks to Section A.1. above.

In response to applicant's argument that the references fail to show an auxiliary module **removably connected to a medical imaging device that both cools and** circulates cooling fluid. It is noted that if it can be connected to a medical imaging device, it can be disconnected from the medical imaging device.

19. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section B. 2.), the Applicant makes the following point when arguing that Okamura et al. does not anticipate claim 5.

The Applicant argues that Okamura et al. "does not, either expressly or inherently, describe cooling ducts that are removably connected to the imaging element". As the Applicant has pointed out in the Applicant's Remarks (section B. 2.) filed 17 October 2005, "The x-ray detector (14) is accommodated in, for example, a glass casing (15), and a cooling tube (16) through which the cooling water (5) flows, is **disposed on** the upper surface of the glass casing (15)." The cooling tube (16) as shown in Figure 5 is disposed on the heat conducting plate (17c) with the only requirement to it to perform its function is that it be in thermal contact with the plate. This does not require it to be permanently affixed to the plate but merely be disposed on (be put in place).

20. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section C.), the Applicant makes the following point when arguing that Anderton does not anticipate claims 11-15.

In response to applicant's argument that the references fail to show an auxiliary module that is **separate, distinct, and removably connected to a medical imaging device**. It is noted that if it can be connected to a medical imaging device, it can be disconnected from the medical imaging device.

21. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section D.), the Applicant

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makes the following point when arguing that Yahata et al. does not anticipate claims 11, 12 and 16.

In response to applicant's argument that the references fail to show an auxiliary module that is ***separate, distinct, and removably connected to a medical imaging device***. It is noted that if it can be connected to a medical imaging device, it can be disconnected from the medical imaging device.

22. Applicant's arguments filed 17 October 2005 have been fully considered but they are not persuasive. With respect to the Applicant's Remarks (section E.), the Applicant makes the following point when arguing that Busse et al. does not anticipate claims 1-4, 6-7 and 25-26.

As noted in the Busse et al. 102(b) rejection of claim 1 above, the auxiliary module is outlined as components outlined in Figure 2. As noted in the Figure, the heat exchanger (6) is interfaced to the detector (1) and the x-ray source (2) by sub-duct system (7) and (9). The heat exchanger (6) and the system of ducts that circulate the cooling medium is considered to be removably connected since the sub-duct system can be cut by any means thereby allowing the auxiliary module to be removed. Similarly, as noted in the Busse et al. 102(b) rejection of claim 25 above, the auxiliary module is considered to be removably by any means.



***Conclusion***

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M. Corbett whose telephone number is (571) 272-8284. The examiner can normally be reached on M-F 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMC 12/20/2005

  
**ALLEN C. HO**  
**PRIMARY EXAMINER**